

OSAGE RIVER BASIN OPERATIONS

WATER MANAGEMENT

An Overview of Basin Operations

Water Management Section
Hydrologic Engineering Branch
Kansas City District
Northwestern Division
US Army Corps of Engineers

March 2011



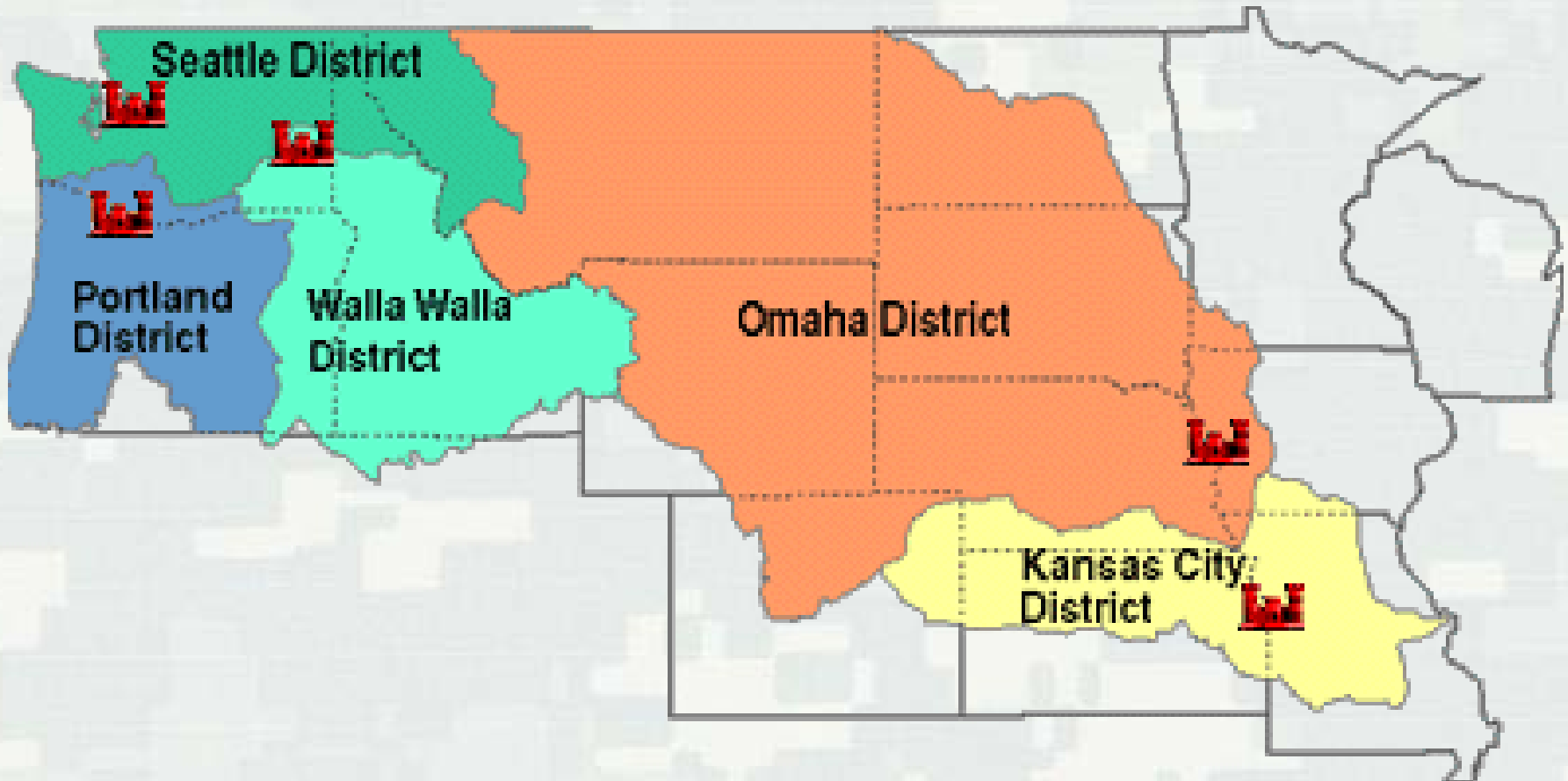
US Army Corps of Engineers
BUILDING STRONG®



USACE Divisions



Northwestern Division



BUILDING STRONG®

Kansas City District



- Total of 18 USACE lakes
- Total of 11 Bureau of Reclamation lakes



Osage River Basin

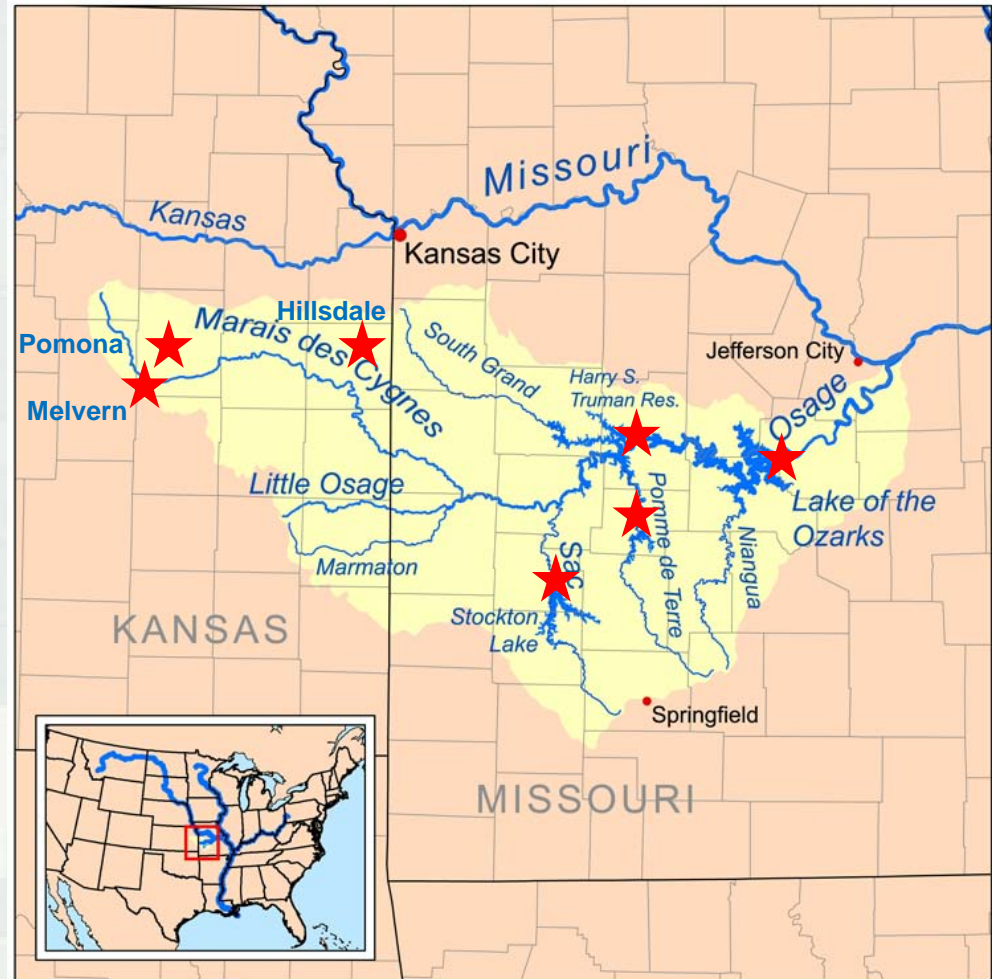
Covers roughly 15,000 square miles over two states

Lakes in Kansas:

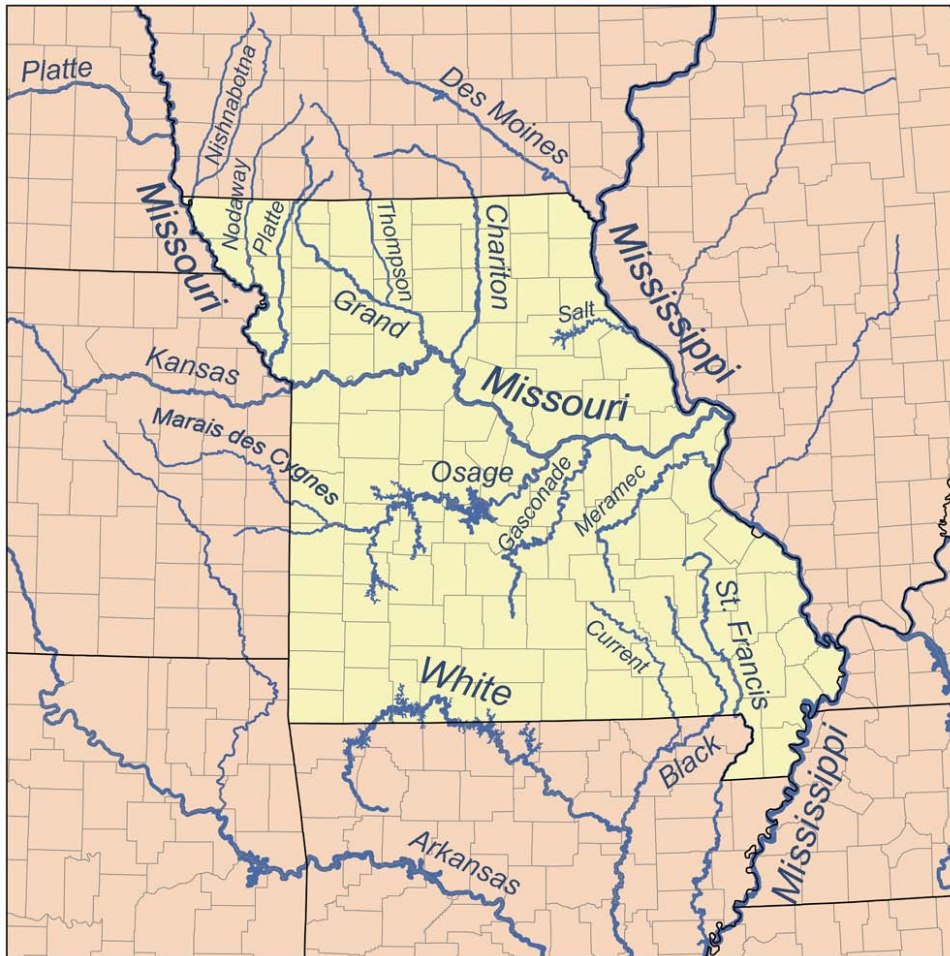
- Melvern
- Pomona
- Hillsdale

Lakes in Missouri:

- Stockton
- Pomme De Terre
- Harry S. Truman
- Lake of the Ozarks, Bagnell Dam (Ameren)



Water Management



- Job is to regulate KCD lake releases
- Releases contribute to Missouri River, Mississippi River
- Operation requires extensive analysis, communication



Authorized Purposes

Osage River Basin Lakes

- Flood Control
- Hydroelectric Power Production
- Water Supply
- Water Quality
- Recreation
- Fish and Wildlife



BUILDING STRONG®

Flood Control Operations

Lake Regulation Manual

- Flood Control Zones
- Control Points
- System Balance
 - ▶ Upstream
 - ▶ Downstream



Flood Control Operations

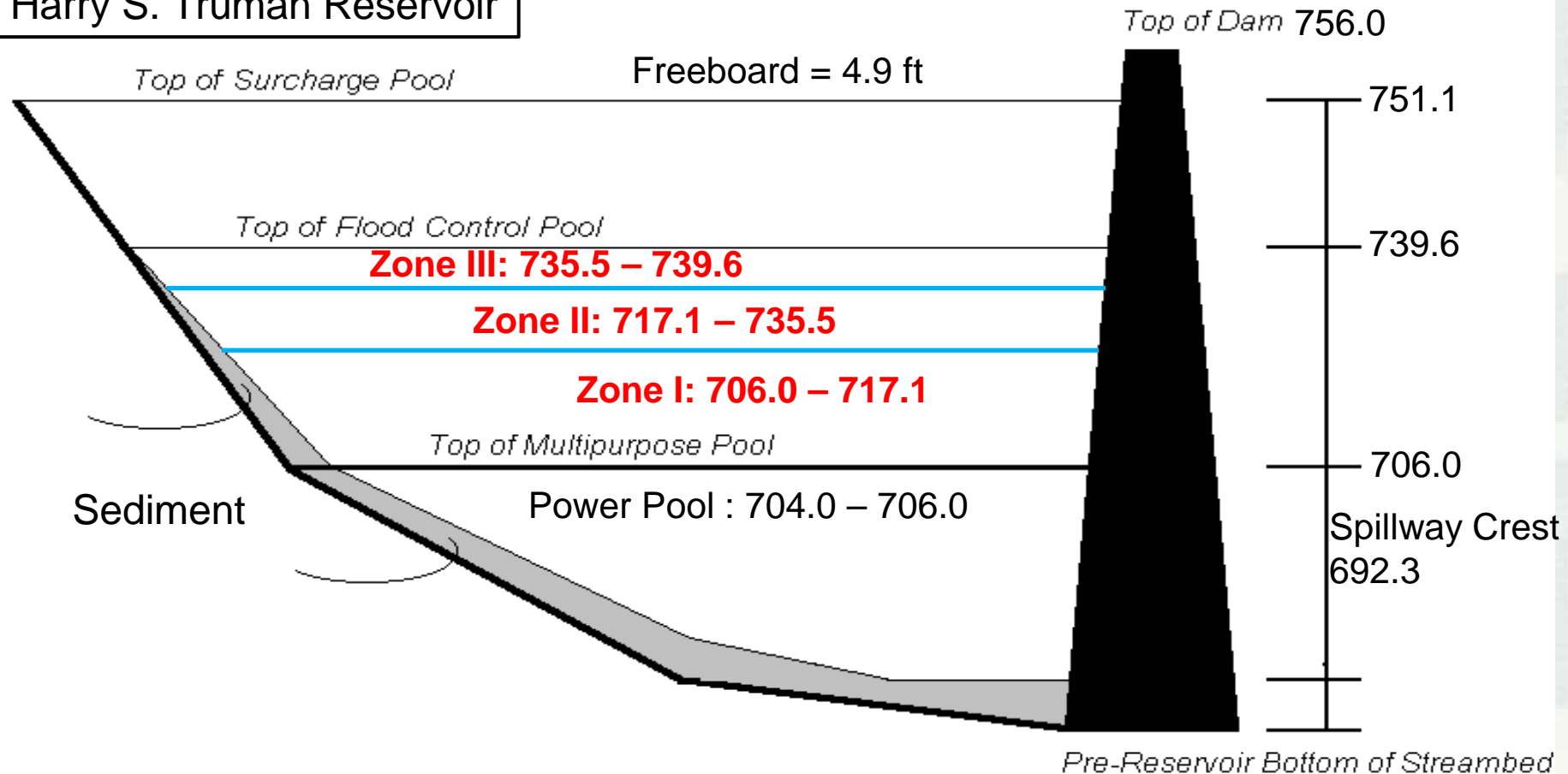
Lake Regulation Manual

- **Flood Control Zones: Storage**
- Control Points
- System Balance
 - ▶ Upstream
 - ▶ Downstream



Flood Control Zones

Harry S. Truman Reservoir



Not to scale

Flood Control Operations

Lake Regulation Manual

- Flood Control Zones
- **Control Points: Specific downstream locations with measured flow**
- System Balance
 - ▶ Upstream
 - ▶ Downstream

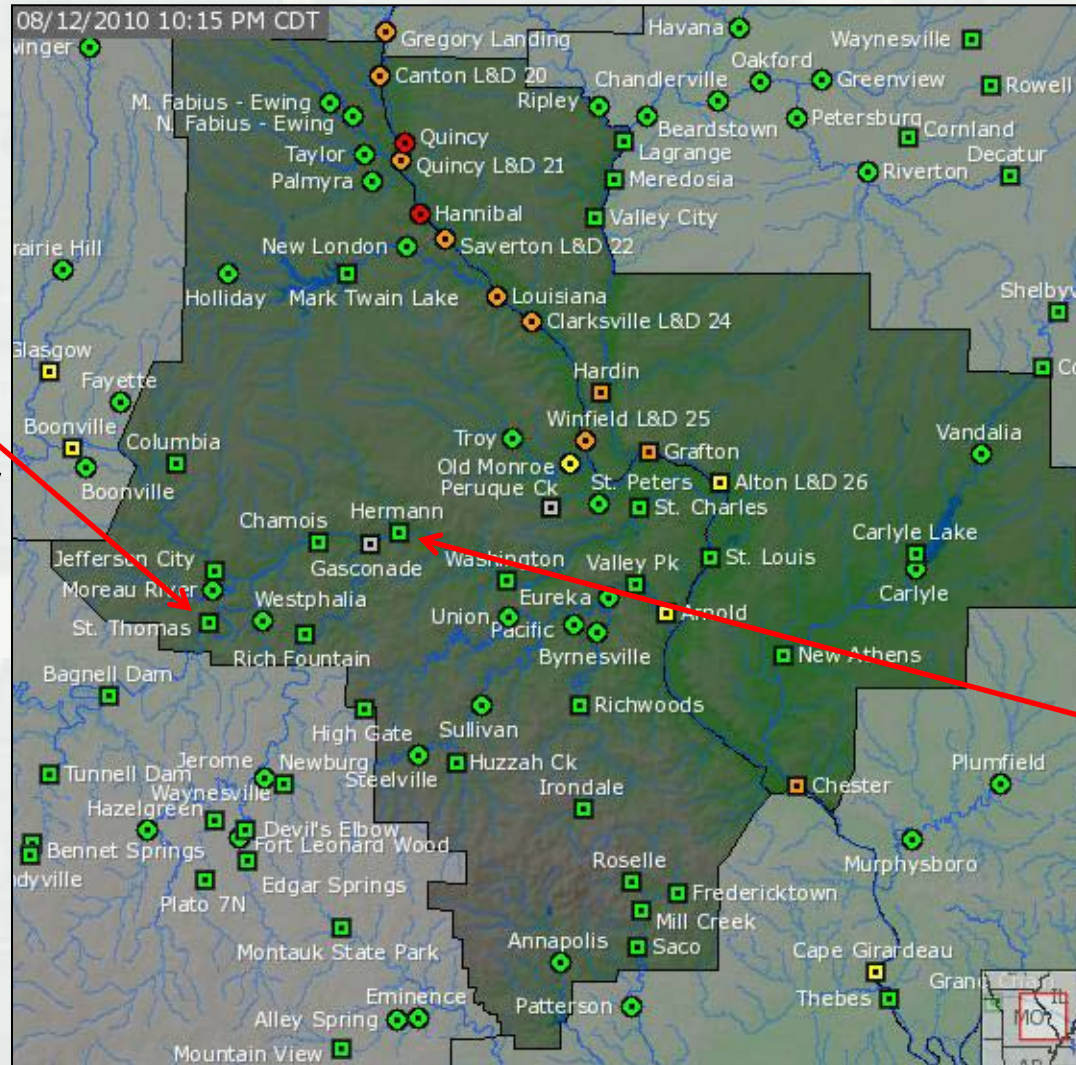


Control Points

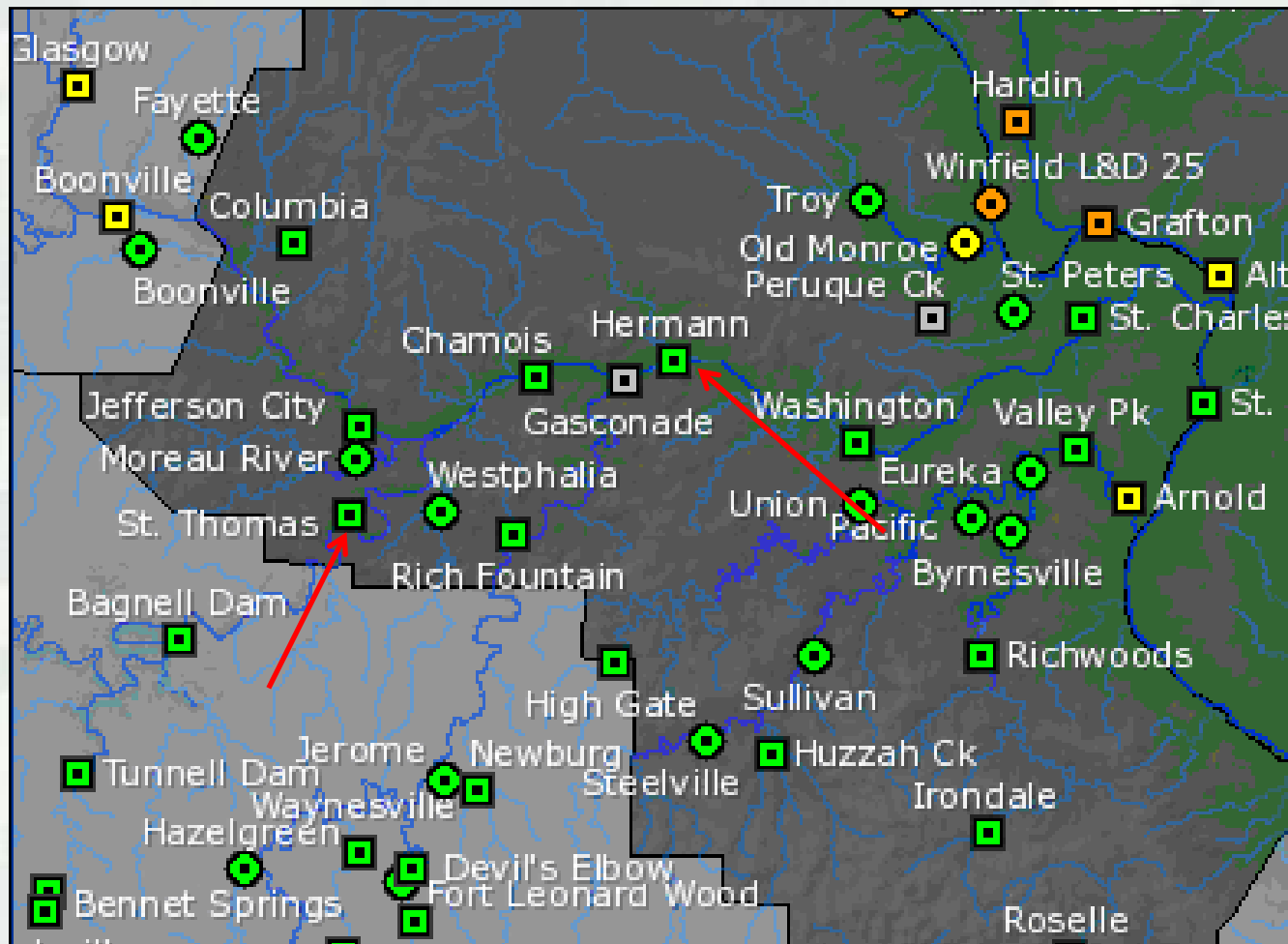
- Osage River Basin
 - ▶ Ottawa
 - ▶ State Line/Trading Post
 - ▶ Hermitage
 - ▶ Caplinger Mills
 - ▶ St. Thomas
 - ▶ Hermann



Truman Control Points



Truman Control Points



Maximum flows

St. Thomas:

Zone I: 34,000 cfs

Zone II: 54,000 cfs

Zone III: 80,000 cfs

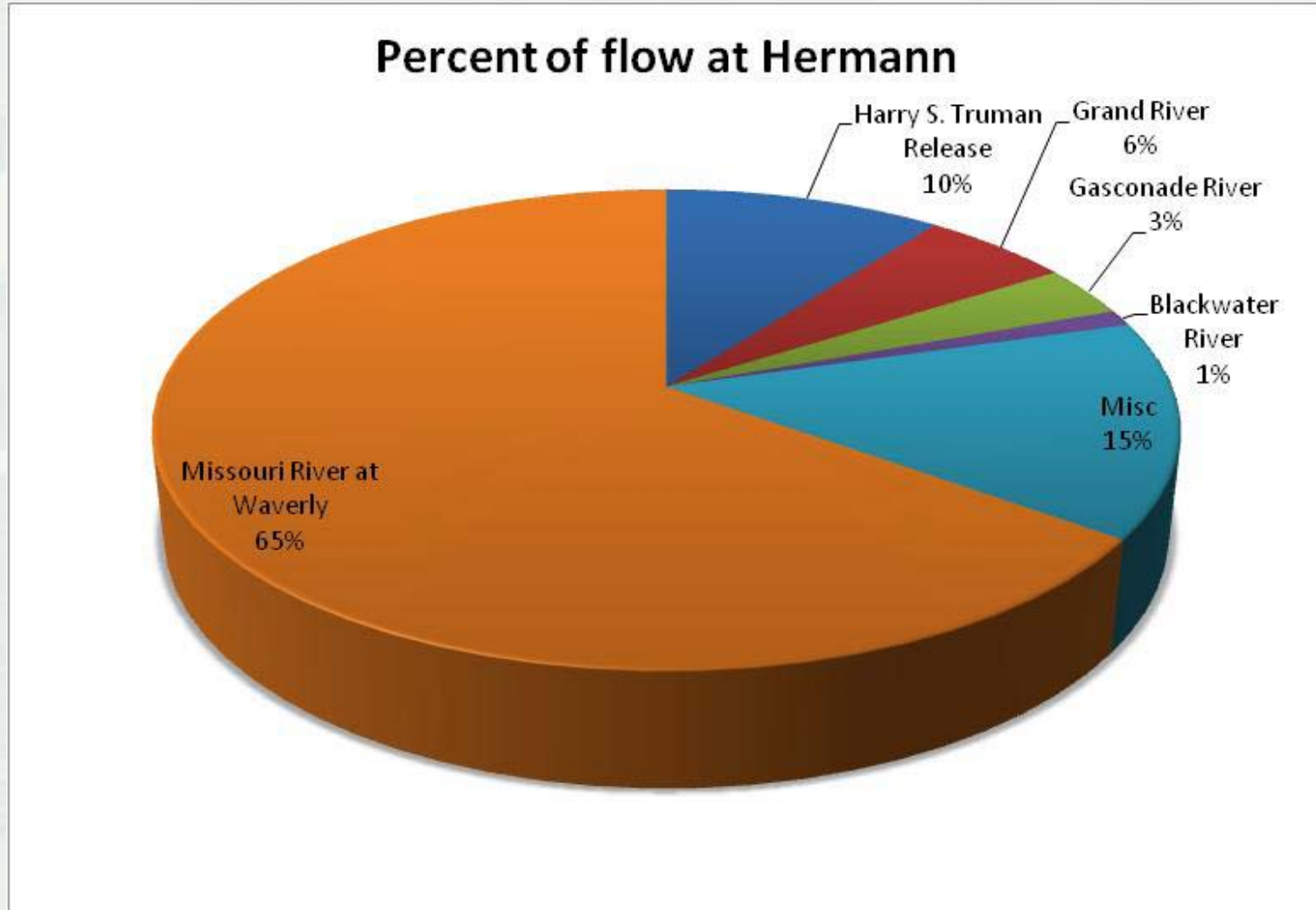
Hermann:

Rising: 260,000 cfs

Falling: 90% of crest



Flows Contributing to Hermann



Flood Control Operations

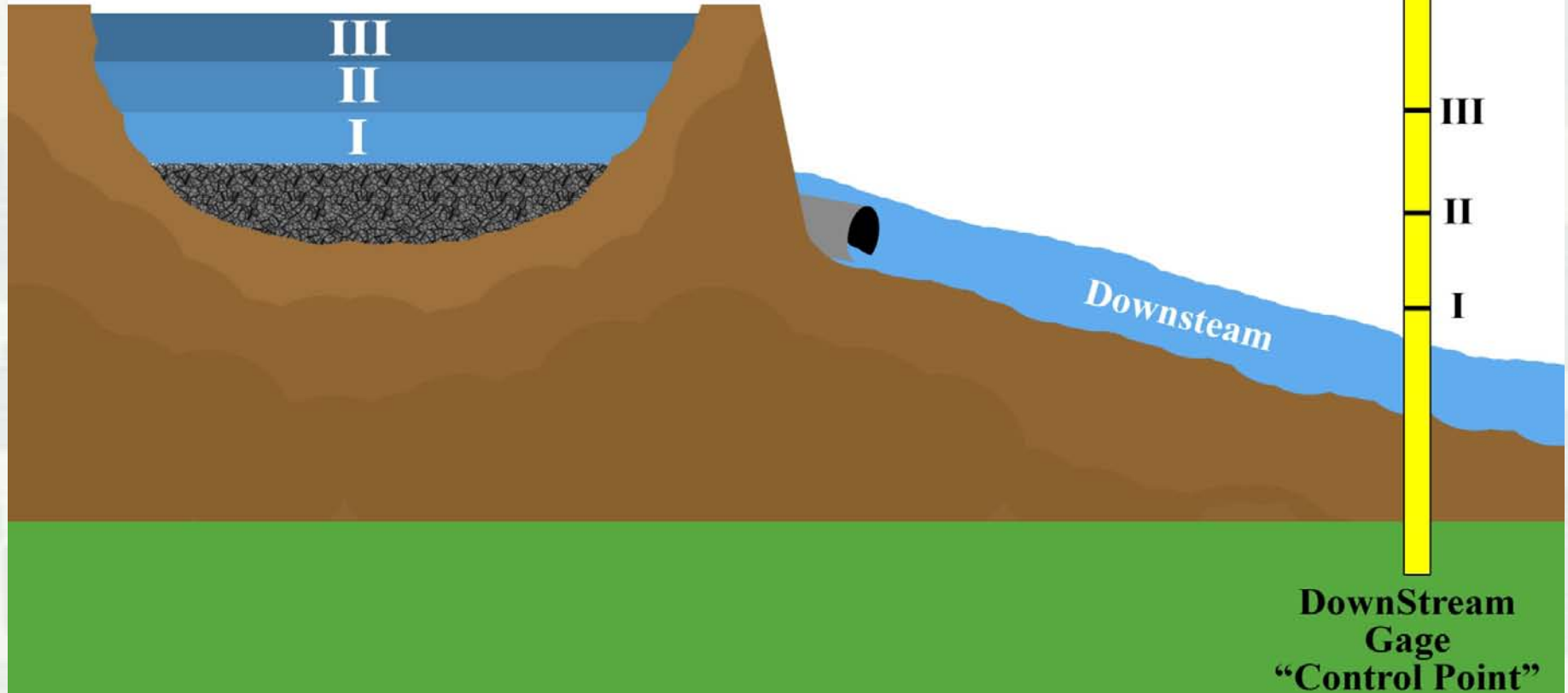
Lake Regulation Manual

- **Flood Control Zones**
- **Control Points**
- System Balance
 - ▶ Upstream
 - ▶ Downstream



FC Zones & Control Points

Flood Control Zones



Not to scale

Flood Control Operations

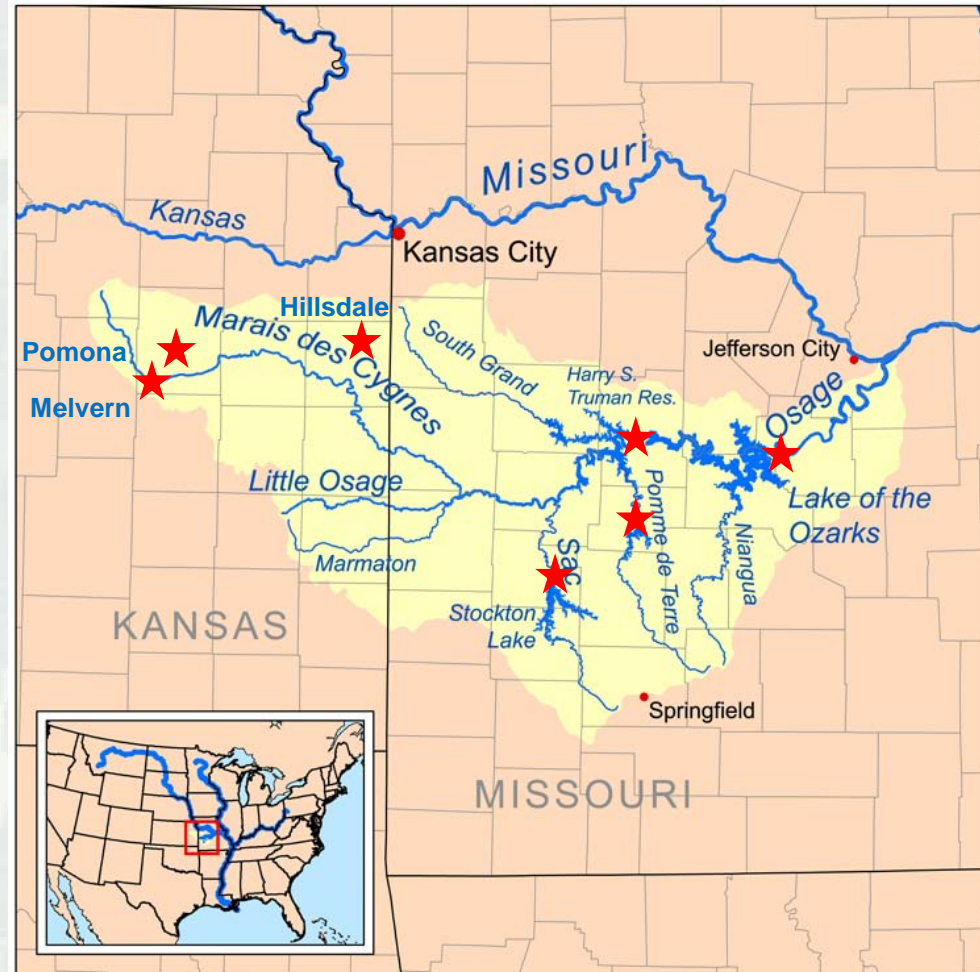
Lake Regulation Manual

- Flood Control Zones
- Control Points
- **System Balance**
 - ▶ **Upstream**
 - ▶ **Downstream**



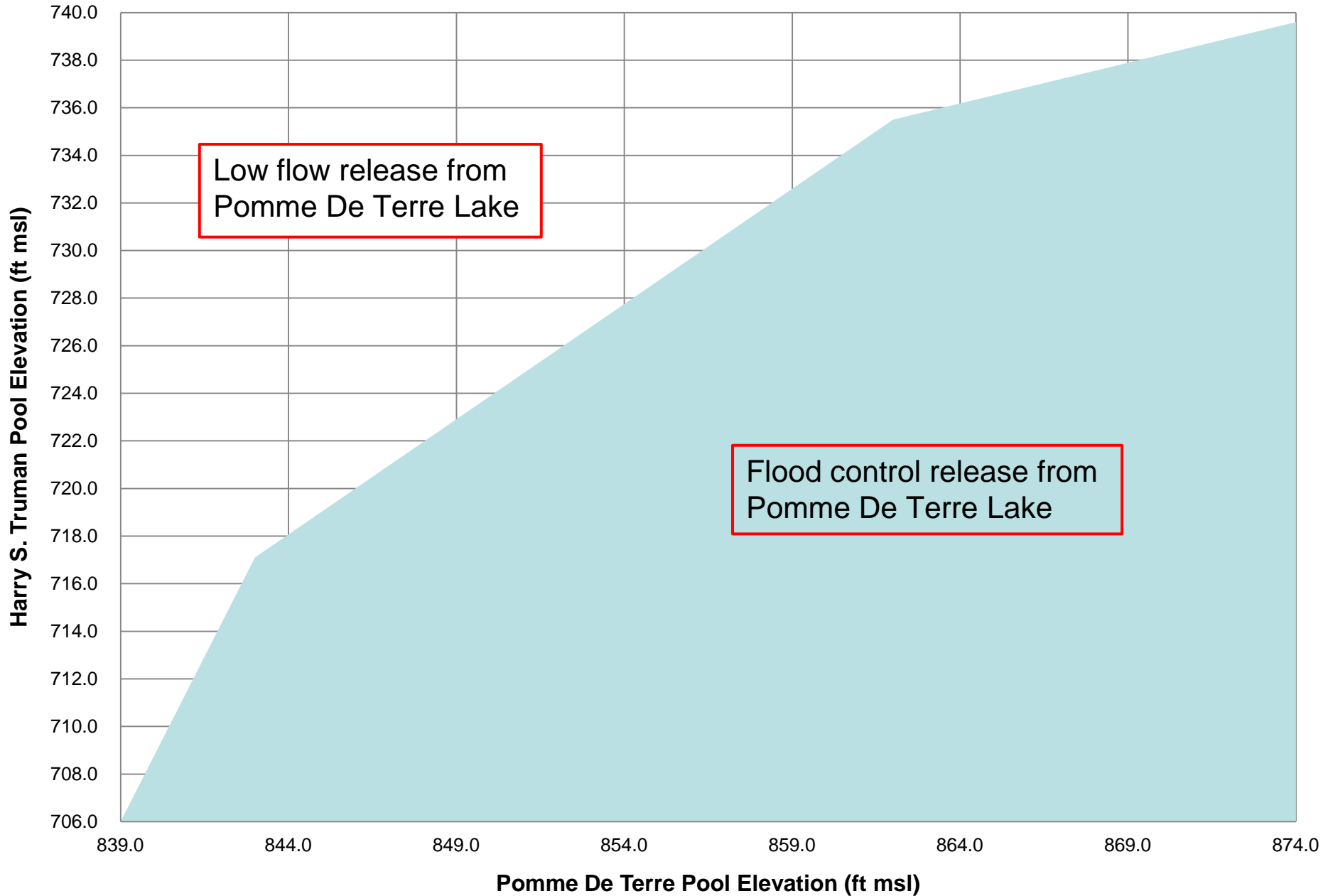
Tandem Balance

- Release from one reservoir becomes inflow to another
- Limits u/s* releases to keep flood control storage proportionate
- Five u/s* reservoirs operate in tandem with Truman



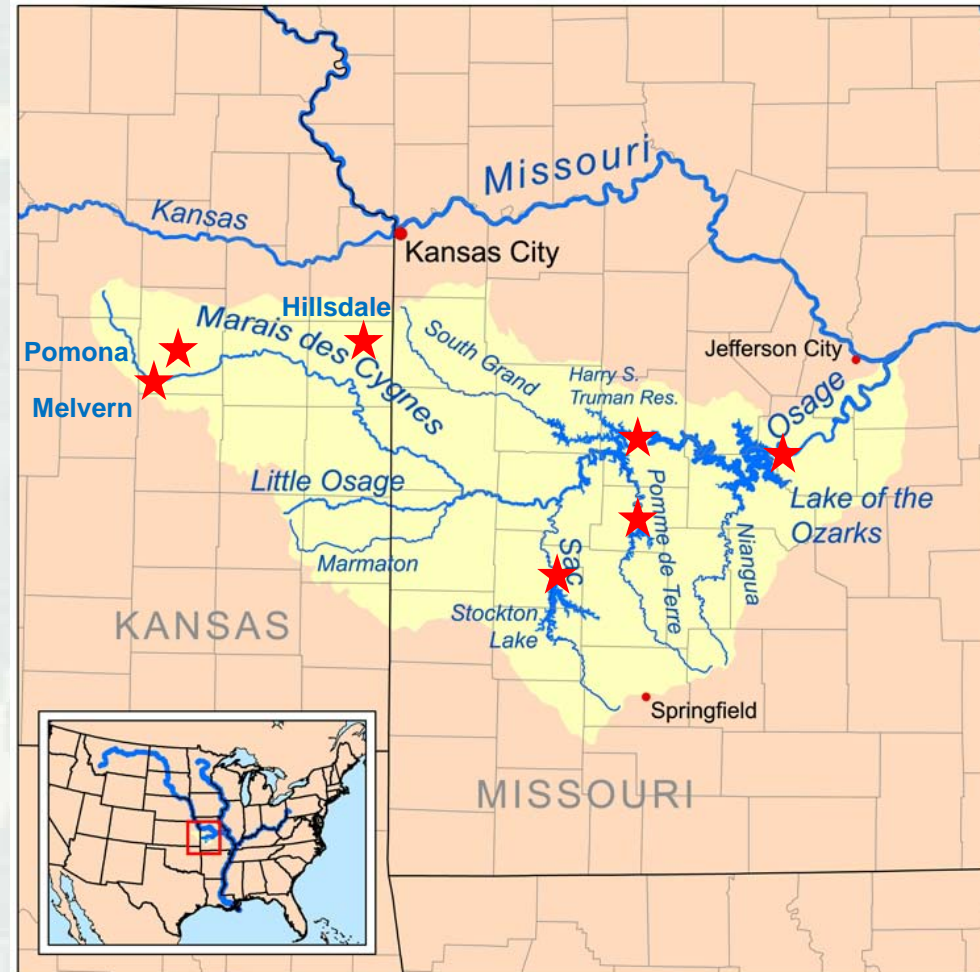
*u/s = upstream

Pomme De Terre & Harry S. Truman Tandem Balance



Tandem Balance

- Five lakes operate in tandem with Truman
- Travel Time
- Rain
- Local Inflow
- Uncontrolled Inflow



Flood Control Operations

Lake Regulation Manual

- Flood Control Zones
- Control Points
- **System Balance**
 - ▶ **Upstream**
 - ▶ **Downstream**



Ameren

- Lake of the Ozarks, Bagnell Dam
- Hydroelectric Dam
- Daily communication
- Memorandum of Agreement (MOA)



BUILDING STRONG®

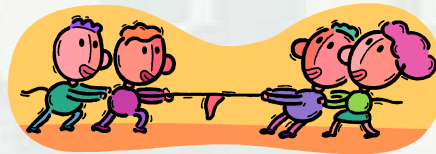
Memorandum of Agreement

- Agreement between USACE and Ameren
 - ▶ Ameren may request low flow from Truman
 - ▶ USACE requests curtailment of Ameren's release due to downstream flooding
 - ▶ Ameren may pass local, uncontrolled inflows during flood events



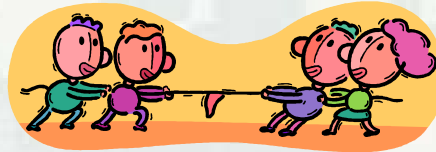
Communication

- US Geological Survey
- National Weather Service
- Southwestern Power Administration
- Stakeholders



Communication

- **US Geological Survey**
- **National Weather Service**
- Southwestern Power Administration
- Stakeholders



Data Collection

- US Geological Survey
 - ▶ River and lake gages
- National Weather Service to USACE
 - ▶ Lake inflow forecast
 - ▶ River flow forecast
 - ▶ Precipitation records
 - ▶ Forecasted precipitation
- USACE to National Weather Service
 - ▶ Lake release changes
 - ▶ Lake forecasts



Communication

- US Geological Survey
- National Weather Service
- **Southwestern Power Administration**
- Stakeholders



Southwestern Power Administration



- Schedule power generation for parts of Arkansas, Kansas, Louisiana, Missouri, Oklahoma, and Texas from 24 USACE multipurpose dams
- Coordinate Stockton and Truman operations
- Memorandum of Understanding (MOU)



BUILDING STRONG®

Memorandum of Understanding

- Understanding between USACE and SWPA
 - ▶ Information exchange
 - USACE: water available
 - SWPA: power needs
 - ▶ Current lake elevation
 - ▶ Daily lake inflow
 - ▶ Downstream flooding: USACE will shut down



Communication

- US Geological Survey
- National Weather Service
- Southwestern Power Administration
- **Stakeholders**



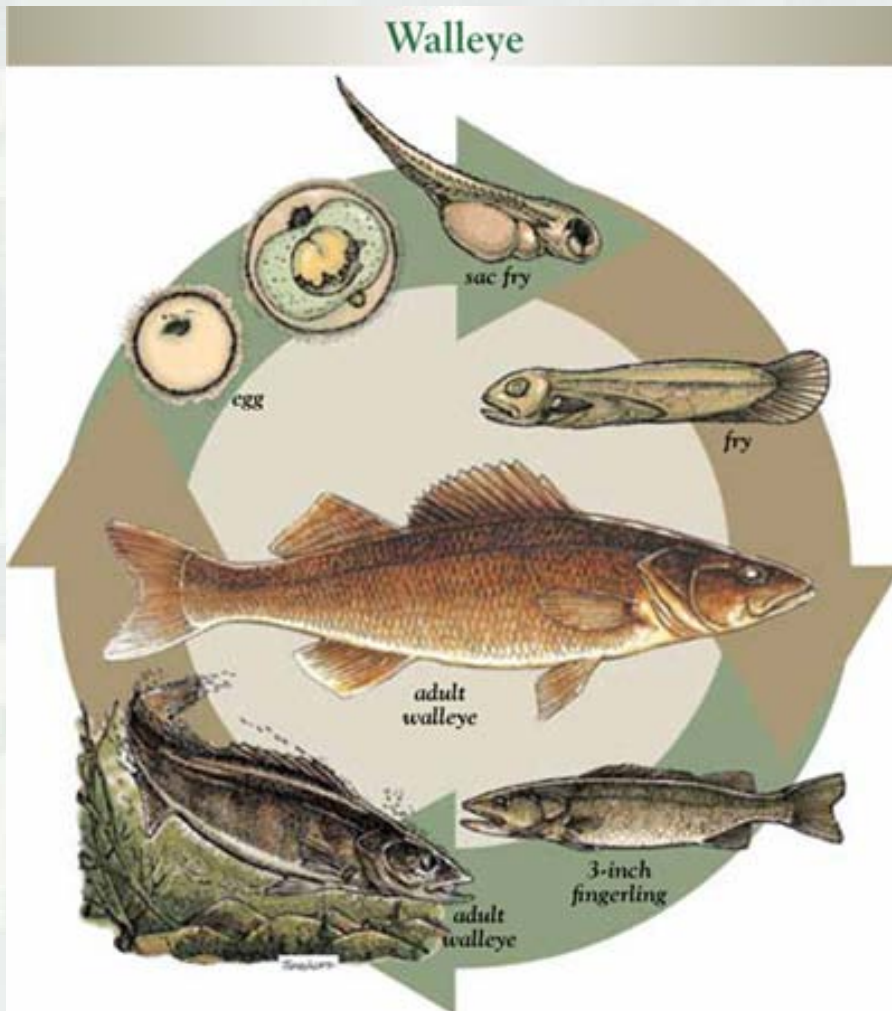
Harry S. Truman Consensus Operating Plan

- Agreement among State of Missouri, Southwestern Power Administration, USACE
- Rules for power generation
- No impact on total volume of release
- Boating, recreation safety
- Fish spawn



BUILDING STRONG®

Downstream Fish Spawn



- State of Missouri initiates coordination
- Usually begins in March
- Minimum flow:
 - ▶ If pool is 706.0+:
Run 1 unit continuously
 - ▶ If pool is below 706.0:
Spill inflows



Water Management Daily Reports



US Army Corps of Engineers
Kansas City District

BUILDING STRONG®

NEWS ROOM

WHO WE ARE

MISSION

HISTORY

SEARCH

Kansas City District » Water Management

Water Management

Phone: (816)389-3545
Fax: (816)389-2011

- [District Map With Links to Each Corps Lake](#)
- [Missouri Basin River and Reservoir Conditions](#)
- [Missouri River Flow Frequency Information](#)
- [Annual Report of Reservoir Regulation Activities](#)

USGS Current Stream Flow Data

- [United States](#)
- [Missouri](#)
- [Kansas](#)
- [Nebraska](#)
- [Iowa](#)
- [Historic Stream and Peak Flow Data](#)

USGS Lake Gages

- [Missouri](#)
- [Kansas](#)
- [Nebraska](#)
- [Iowa](#)

Kansas City Area Weather

[National Weather Maps District Radar](#)
[NWS Regional Radar Kansas City Radar](#)
[Overland Park Flood Warning](#)
[NWS Watches, Warnings Kansas City Forecast](#)

Current Conditions, Forecasts, and Special Reports

[NWS Info By State](#)
[Missouri Cities](#)
[Kansas Cities](#)
[Colorado Cities](#)
[Iowa Cities](#)
[Nebraska Cities](#)
[Missouri Fishing - MDC](#)
[Kansas Fishing - KDWP](#)

Water Management Daily Reports

[Key Gages \(Radio Room Report\) \(RAW Data\)](#)
[MRR Daily River Bulletin](#)
[NWK Daily Reservoir Data \(RAW Data\)](#)
[8-Day River Report \(RAW Data\)](#)
[8-Day Reservoir Report \(RAW Data\)](#)
[3-Day Reservoir Forecast \(RAW Data\)](#)

Other River and Lake Information

[Missouri River Forecast Center](#)
[NWS Kansas River Forecasts](#)
[NWS Missouri River Forecasts](#)
[NWS River Watch](#)
[HPC QPF Forecasts](#)
[USBR River and Dam Data](#)

Links to WM
daily reports

3-Day Reservoir
Forecast Report

Water Management's Home Page



US Army Corps of Engineers
Kansas City District

BUILDING STRONG®

NEWS ROOM

WHO WE ARE

MISSION

HISTORY

SEARCH

Kansas City District » Water Management

[RAW Text Version](#)

Kansas City District Lake Forecast

	03 Mar 2011			Day 1		Day 2		Day 3	
	MPP	Elevation	Outflow	Elevation	Outflow	Elevation	Outflow	Elevation	Outflow
Gavins Pt.			21000		21000		21000		21000
Kanopolis	1463.0	1464.09	22	1464.10	22	1464.10	22	1464.10	22
Wilson	1516.0	1515.58	5	1515.58	5	1515.58	5	1515.58	5
Harlan Co	1945.7	1946.97	50	1947.01	50	1947.04	50	1947.07	50
Milford	1144.4	1143.90	25	1143.98	800	1143.96	800	1143.93	800
Tuttle Creek	1075.0	1072.44	2000	1072.22	1000	1072.17	1000	1072.11	1000
Perry	891.5	890.56	800	890.45	800	890.33	800	890.20	800
Clinton	875.5	875.77	500	875.66	500	875.54	500	875.41	500
Smithville	864.2	862.80	1000	862.55	500	862.44	500	862.32	500
Longview	891.0	892.18	188	891.93	120	891.78	82	891.69	57
Blue Springs	802.0	803.43	140	803.33	125	803.24	112	803.16	100
Melvern	1036.0	1036.32	250	1036.33	500	1036.25	500	1036.15	500
Pomona	974.0	974.63	500	974.46	500	974.27	500	974.07	500
Hillsdale	917.0	917.23	8	917.27	500	917.08	500	916.88	500
Stockton	867.0	867.00	13760	865.96	12200	865.00	11100	864.15	10150
Pomme de Terre	839.0	844.63	110	844.80	110	844.93	110	845.04	110
Harry Truman	706.0	712.08	30000	712.13	30000	712.13	28000	712.07	28000
Rathbun	904.0	904.02	1500	903.77	1500	903.50	1500	903.22	1500
Long Branch	791.0	793.24	223	793.17	215	793.07	202	792.96	189

www.nwk.usace.army.mil/watermanagement/

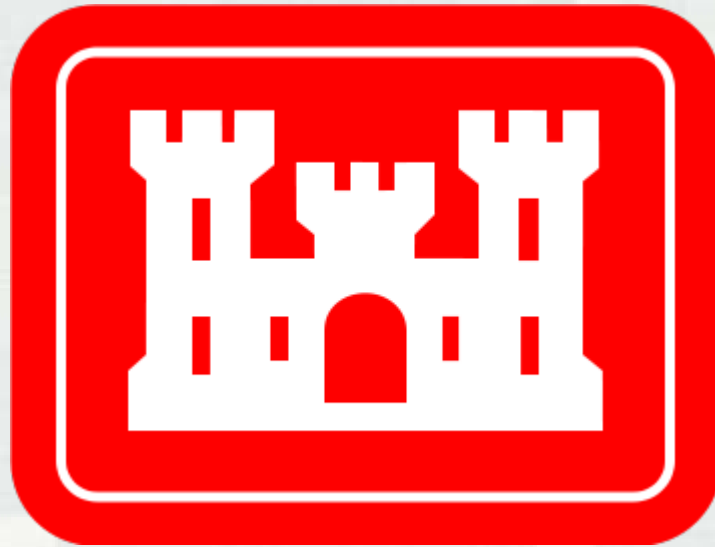
BUILDING STRONG®

Osage River Basin

- Operating requires
 - ▶ Data collection
 - ▶ Analysis
 - ▶ Tandem balance
 - ▶ Control points
 - ▶ Communication
- Result: Balance of all authorized purposes at each of the Osage River Basin reservoirs



Thank you for your interest



in the operation of the Osage River Basin.



BUILDING STRONG®